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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.           | CONFIRMATION NO. |
|---|-------------|----------------------|-------------------------------|------------------|
| 10/659,541  | 09/09/2003  | Hardayal Singh Gill  | HIT1P049/HSJ9-2003-0205US     | 3072             |
| 50535   | 7590        | 03/18/2005           |                               |                  |
| ZILKA-KOTAB, PC<br>P.O. BOX 721120<br>SAN JOSE, CA 95172-1120 |             |                      | EXAMINER<br>WATKO, JULIE ANNE |                  |
|   |             |                      | ART UNIT                      | PAPER NUMBER     |
|   |             |                      | 2653                          |                  |

DATE MAILED: 03/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/659,541

Applicant(s)

GILL, HARDAYAL SINGH

Examiner

Julie Anne Watko

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-8,10-13,15-18 and 20-23 is/are rejected.
- 7) ☒ Claim(s) 2,9,14 and 19 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 09/09/2003.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Drawings***

1. Figures 1A-6 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

2. Claim 18 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The limitations of claim 18 have already been recited in parent claim 13.

### ***Double Patenting***

3. Applicant is advised that should claim 13 be found allowable, claim 18 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 11 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Saito et al (US PAP No. 2001/0004307).

As recited in independent claim 1, Saito et al show a magnetic head (see Fig. 3; see also Figs. 27 and 30, for example) having an air bearing surface (see right surface in Fig. 3) comprising a free layer structure 220 comprising a first free layer 223 having a magnetic moment; a second free layer 221 having a magnetic moment pinned antiparallel to the magnetic moment of the first free layer; and a third free layer 225 having a magnetic moment oriented parallel to the magnetic moment of the second free layer; wherein ends of the third free layer 225 define track edges of the third free layer; wherein the first and second free layers extend beyond the track edges in a direction parallel to the ABS (see Fig. 27, in which 223 and 221 extend beyond edges of 225).

As recited in independent claim 23, in addition to the above teaching, Saito et al show a magnetic storage system (see ¶ 0008) comprising: magnetic media (“hard disk”, see ¶ 0008), at least one head (see Fig. 3) for reading from and writing to the magnetic media, each head having a sensor (see 1 in Fig. 3; see also Fig. 27), a write element (including 167 and 178) coupled to the sensor (see Fig. 3); a slider (see Fig. 2) for supporting the head; and a control unit (inherently) coupled to the head for controlling operation of the head.

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As recited in claim 11, Saito et al show that the head forms part of a CIP (see location of electrical leads 334 in Fig. 27) GMR (see ¶ 0004) sensor.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 3-7, 10 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al (US PAP No. 2001/0004307).

Saito et al show a magnetic head as described above.

As recited in claims 3-6 and 15-16, Saito et al are silent regarding the claimed relative dimensions.

It is well established that it is obvious to alter the dimensions of a known apparatus, absent persuasive evidence of unexpected results due to the claimed dimensions.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to arrive at the claimed dimensions through the process of routine experimentation and optimization in the absence of criticality *Gardner v. TEC systems, Inc.*, 220 USPQ 777 (Fed. Cir. 1984). The rationale is as follows: one of ordinary skill in the art would have been motivated to arrive at the claimed dimensions through the process of routine experimentation and optimization in order to achieve sensitivity to magnetic signals from a recording medium as is notoriously well known in the art.

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As recited in claims 7 and 17, Saito et al show at least one biasing layer 332 positioned outside the track edge of the third free layer in a direction parallel to the ABS, each biasing layer 332 being for pinning a magnetic orientation of portions of the free layer closest thereto and positioned outside the track edges of the third layer (see ¶ 0021, “The bias layers 332 orient the magnetization direction of the first free magnetic layer 310 in the X.sub.1 direction to bring the free magnetic layer 311 in a single magnetic domain state, suppressing Barkhausen noise of the free magnetic layer 311”).

As recited in claims 7 and 17, Saito et al are silent regarding the biasing layers being antiferromagnetic (AFM) layers.

Official notice is taken of the fact that it was known in the art at the time the invention was made to provide AFM layers as biasing layers.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the biasing layers of Saito et al with AFM layers as is notoriously well known in the art. The rationale is as follows: one of ordinary skill in the art would have been motivated to replace the biasing layers with AFM layers in order to avoid particulate contamination that results from corrosion of hard magnetic materials as is notoriously well known in the art.

As recited in claim 10, Saito et al are silent regarding a CPP sensor.

Official notice is taken of the fact that it was known in the art at the time the invention was made to use a spin valve in a CPP sensor.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the spin valve of Saito et al in a CPP sensor as is notoriously well known in the

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art. The rationale is as follows: one of ordinary skill in the art would have been motivated to use the spin valve in a CPP sensor in order to avoid shunting current as is notoriously well known in the art.

8. Claims 8, 13, 18 and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al (US PAP No. 2001/0004307) in view of IBM (TDB Dec. 2001, no. 452, p. 2016).

Saito et al show a head as described above.

As recited in claims 8, 13 and 18, in addition to the above teachings, Saito et al show an antiparallel (AP) pinned layer having at least two pinned layers having magnetic moments that are pinned antiparallel to each other.

As recited in claim 13, in addition to the above teachings, Saito et al show the free layer structure spaced apart from the AP pinned layer structure.

As recited in claims 8 and 13 and 18, Saito et al are silent regarding the AP pinned layer being self-pinned.

As recited in claims 8 and 13 and 18, IBM teaches that self-pinning is advantageous because "The elimination of the antiferromagnetic allows thinner Tunnel Valve sensor stack for future short gap heads as well as simplifies the head fabrication".

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the AP pinned layer of Saito et al as self-pinned AP pinned layer as taught by IBM. The rationale is as follows: one of ordinary skill in the art would have been motivated to eliminate the AFM layer 22 of Saito et al in order to simplify head fabrication by eliminating a blocking step as taught by IBM and as is notoriously well known in the art.

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As recited in claim 13, Saito et al are further silent regarding the relative dimensions recited in lines 16-18.

See case law, rationale and motivation above for claims 3-6 and 15-16.

Regarding claim 20: See teachings, official notice, rationale and motivation above for claim 10.

Regarding claim 21: See teachings above for claim 11.

9. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al (US PAP No. 2001/0004307) in view of Brug et al (US Pat. No. 5930087).

Saito et al show a head as described above.

As recited in claim 12, Saito et al are silent regarding a tunnel valve sensor.

Brug et al teach that “total power consumption of the recording head 10 is relatively low because a tunnel sensor is a relatively high impedance structure. A lower power consumption recording head may be useful for tape heads in which many parallel channels exist” (see col. 5, lines 29-34).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a head with the free layer of Saito et al in a tunnel valve sensor as taught by Brug et al. The rationale is as follows: one of ordinary skill in the art would have been motivated to use the head in a tunnel valve sensor in order to reduce power consumption as taught by Brug et al and as is notoriously well known in the art.

10. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al (US PAP No. 2001/0004307) in view of IBM (TDB Dec. 2001, no. 452, p. 2016) as applied to claims 8, 13, 18 and 20-21 above, and further in view of Brug et al (US Pat. No. 5930087).



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Saito et al show a head as described above.

As recited in claim 22, Saito et al are silent regarding a tunnel valve sensor.

See teachings, rationale, and motivation for combining teachings above for claim 12.

***Allowable Subject Matter***

11. Claims 2, 9, 14 and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

12. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

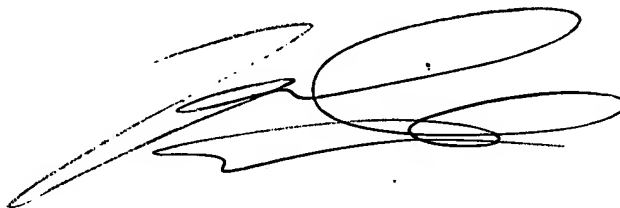
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julie Anne Watko whose telephone number is (571) 272-7597. The examiner can normally be reached on Tues. & Thurs. until 9PM, Wed. & Fri. until 5PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William R. Korzuch can be reached on (571) 272-7589. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Julie Anne Watko  
Primary Examiner  
Art Unit 2653

March 12, 2005  
JAW

A handwritten signature in black ink, appearing to read 'Julie Anne Watko', with a stylized, cursive script.